

CLAIMS

WE CLAIM:

1. An inoculum for application to plants, said inoculum comprising a carrier and an effective quantity of bacteria, the bacteria selected from *Herbaspirillum seropedicae* 2A (ATCC No. PTA-2742), *Pantoea agglomerans* P101 (ATCC No. PTA 2744), *Pantoea agglomerans* P102 (ATCC No. PTA 2740), *Klebsiella pneumoniae* 342 (ATCC No. PTA-2743), *Klebsiella pneumoniae* zmvsy (ATCC No. PTA-2741), *Herbaspirillum seropedicae* Z152 (ATCC No. 35894), *Gluconacetobacter diazotrophicus* PA15 (ATCC No. 49037) and mutant strains derived therefrom, said mutant strains able to enhance the growth of plants.
2. An inoculum for application to plants, the inoculum comprising a carrier and an effective quantity of a *Klebsiella pneumoniae* bacterial strain.
3. An inoculum for application to plants other than legume plants, the inoculum comprising a carrier and an effective quantity of a *Pantoea agglomerans* bacterial strain.
4. A biologically pure bacterial culture wherein the bacteria is selected from *Herbaspirillum seropedicae* 2A (ATCC No. PTA-2742), *Pantoea agglomerans* P101 (ATCC No. PTA 2744), *Pantoea agglomerans* P102 (ATCC No. PTA 2740), *Klebsiella pneumoniae* 342 (ATCC No. PTA-2743), and *Klebsiella pneumoniae* zmvsy (ATCC No. PTA-2741).
5. A biologically pure culture of a mutant strain, the mutant strain derived from either *Herbaspirillum seropedicae* 2A (ATCC No. PTA-2742), *Pantoea agglomerans* P101 (ATCC No. PTA 2744), *Pantoea agglomerans* P102 (ATCC No. PTA 2740), *Klebsiella pneumoniae* 342 (ATCC No. PTA-2743), or *Klebsiella pneumoniae* zmvsy (ATCC No. PTA-2741), wherein the mutant strain retains the ability to enhance the growth of plants.
6. A method for enhancing the growth of a plant, the method comprising the step of placing in the vicinity of the plant an effective quantity of bacteria, the bacteria selected from *Herbaspirillum seropedicae* 2A (ATCC No. PTA-2742), *Pantoea agglomerans* P101 (ATCC No. PTA 2744), *Pantoea agglomerans* P102 (ATCC No. PTA 2740), *Klebsiella pneumoniae* 342 (ATCC No. PTA-2743), *Klebsiella pneumoniae* zmvsy (ATCC No. PTA-2741), *Herbaspirillum seropedicae* Z152 (ATCC No. 35894), *Gluconacetobacter diazotrophicus* PA15 (ATCC No. 49037) and mutant strains derived therefrom, said mutant strains able to enhance the growth of plants.

7. The method of Claim 6 wherein the plant is either a cereal grass plant or a legume plant.

8. A method for enhancing the growth of a plant, the method comprising the step of placing in the vicinity of the plant an effective quantity of a *Klebsiella pneumoniae* bacterial strain.

9. The method of Claim 8 wherein the plant is either a cereal grass plant or a legume plant.

10. A method for enhancing the growth of a plant other than a legume plant, the method comprising the step of placing in the vicinity of the plant an effective quantity of a *Pantoea agglomerans* bacterial strain.

11. A seed from a cereal grass plant coated with an effective quantity of bacteria to enhance growth, the bacteria selected from *Herbaspirillum seropedicae* 2A (ATCC No. PTA-2742), *Pantoea agglomerans* P101 (ATCC No. PTA 2744), *Pantoea agglomerans* P102 (ATCC No. PTA 2740), *Klebsiella pneumoniae* 342 (ATCC No. PTA-2743), *Klebsiella pneumoniae* zmvsy (ATCC No. PTA-2741), *Herbaspirillum seropedicae* Z152 (ATCC No. 35894), *Gluconacetobacter diazotrophicus* PA15 (ATCC No. 49037) and mutant strains derived therefrom.

12. The seed of Claim 11 wherein the coating also includes a carrier for the bacteria.

13. A method for identifying *Pantoea agglomerans* and *Klebsiella pneumoniae* bacterial strains having the ability to enhance the growth of a cereal grass plant, said method comprising the steps of:

isolating a bacterial isolate wherein the isolate is either a *Pantoea agglomerans* bacterial strain or a *Klebsiella pneumoniae* bacterial strain;

planting a cereal grass seed or a cereal grass seedling with said test material in a planting medium;

growing said planted cereal grass seed or said cereal grass seedling for a time sufficient to allow for a growing seedling to develop and be evaluated for growth enhancement; and

evaluating the growing seedling for evidence of enhanced growth when compared to a growing seedling grown in the absence of the test material.

14. An inoculum for application to plants, the inoculum comprising a carrier and an effective quantity of bacteria wherein the bacteria is identified according to the method of Claim 13.

15. A method for enhancing the growth of a cereal grass plant, said method comprising the steps of placing in the vicinity of the plant an effective quantity of bacteria wherein the bacteria is identified to enhance the growth of a cereal grass plant according to the method of Claim 13.

16. A seed from a cereal grass plant coated with an effective quantity of the bacteria identified according to the method of Claim 13.

17. The seed of Claim 16 wherein the coating also includes a carrier for the bacteria.

TOP SECRET - FEDERAL BUREAU OF INVESTIGATION